

ABSTRACT

The present invention is directed to configurations of eddy current probes and methods for using these probes to detect cracks initiating at the edge of holes in single-layered or multi-layered metallic structures. The new devices and methods are suitable to detect buried cracks around fastener holes located in layers of multi-layered structures, for example in airplane wing splices, containing fasteners disposed in rows. The probes include excitations coils and one or more magnetic sensors. The magnetic sensors can be arranged in absolute, differential or array configurations. The probe is scanned linearly along the fastener row. The invention also contains an apparatus or system for monitoring cracks around holes, including signal processing circuits, driving circuits, data acquisition and display, and scanning systems.